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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,726	10/06/2003	David Haase	EMC-03-100CIP2	2876

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EXAMINER	
FARROKH, HASHEM	
ART UNIT	**PAPER NUMBER**
2187	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/679,726	HAASE ET AL.	
	Examiner	Art Unit	
	Hashem Farrokh	2187	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 2/27/07.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-4,8-11 and 15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-4,8-11,15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 06 October 2005 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This Office Action in response to the communications filed on 2/7/07.The instant application having application No. 10/679,726 has a total of 9 claims pending in the application; claims 1, 8, and 15 have been amended; claims 5-7 and 12-14 have been canceled; no new claims have been added.

INFORMATION CONCERNING CLAIMS:

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> *A person shall be entitled to a patent unless –*
>
> *(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.*

Claims 1-4 and 8-11, and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,898,681 B2 to Young.

1. In regard to claim 1, Young teaches:

"In a data storage environment having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system **(column 4, lines 11-15; element 8 in Fig. 1)**, a method of managing the data content during a restoration of the source," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).** *For example the master store or volume represents the first volume and shadow store or volume*

represents the clone volume recited in the claim. The shadow store contains the point in time copy of master data, which is used for controlling, or managing data during the restoration of the master or the source. When data is overwritten, a new point in time copy is created and the previous point time is protected (e.g., not overwritten).

"the method comprising the steps of:"

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 10, lines 7-10; column 11, lines 55-62).** *For example Young, in column 10, lines 7-44 and flow diagram in Fig. 6c, teaches the restoration step for recovery or restoration of master store or source from the shadow store or clone.*

"allowing host reads and writes to the source;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61; column 10, lines 20-26).**

"if preserving the data content of clone is selected, then not allowing the data content of the clone to be overwritten by host writes during the restoring step." **(e.g., see column 10, lines 27-32; column 11, lines 23-30; column 20, lines 4-7; Fig. 10).** *For example the point-in-time copies in shadow store are preserved.*

"if preserving the data content of the clone is not selected, then overwriting the data content of the clone during the restoring step and determining extents on the source affected by any host write request;" **(e.g., see column 10, lines 18-26; column 11, lines 8-22; column 20, lines 1-3; Fig. 10).** *For example if the user select not to preserve the previous point time copy, the user instruct the controller to overwrite or*

update the current point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.

"if any extents affected by the host write request are involved during the restoring step and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 10, lines 24-26; column 11, lines 8-22; Fig. 10).** *For example if the user select not to preserve a point time copy, the point in time copy is overwritten and the corresponding bit in the bit map is set.*

2. *In regard to claims 2 and 9 Young teaches:*

"wherein the source and the clone are each represented by respective first and second logical units." **(column 2, lines 35-40; column 4, lines 11-15).** *For example Young teaches that that a plurality of volumes are grouped together as a single logical device (e.g., source logical unit). The point in time copy of logical device is stored in shadow storage, which is in separate volumes, or logical device, which represents the clone logical unit recited in the claim.*

3. *In regard to claims 3 and 10 Young teaches:* "wherein a map denominated as a protected restore map is used to track extents of the source that are modified during the restoring and preserving steps." **(e.g., see column 8, lines 22-40; Fig. 6a).** *For example when a block in the master store is overwritten (e.g., modified), a corresponding bit in the shadow bit map is set to logic 1.*

4. *In regard to claims 4 and 11 Young teaches:*

"wherein a map denominated as a clone delta map is used to track extents of the clone that are different between the clone and the source." **(e.g., see column 8, lines 22-40;**

Fig. 6a). *For example copy bit map which represent clone delta map recited in the claim is used to track the data blocks which are different between the master and shadow stores. A logic 1 in the copy bit map indicates that the corresponding data in the master store is different from the shadow store. When data copied from the master to the shadow store the corresponding bit in the copy bit map is being set to a logic 0 indicating that both master store and shadow store contain identical data*

5. In regard to claim 8, Young teaches:

A system **(column 22, lines 24-26)** for managing data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"the system comprising:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"computer-executable program logic configured for causing the following computer-executed steps to occur;" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 10, lines 7-10; column 11, lines 55-62).**

"allowing host reads and writes to the source;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61; column 10, lines 20-26).**

"if preserving the data content of clone is selected, then not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 10, lines 27-32; column 11, lines 23-30; column 20, lines 4-7; Fig. 10).** *For example a point in time copy of data to be overwritten is being saved in the shadow store. Therefore, a copy of data to be overwritten is preserved.*

"if preserving the data content of the clone is not selected, then overwriting the data content of the clone during the restoring step and determining extents on the source affected by any host write request;" **(e.g., see column 10, lines 18-26; column 11, lines 8-22; column 20, lines 1-3).** *For example if the user select not to preserve the previous point time copy, the user instruct the controller to overwrite the point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.*

"if any extents affected by the host write request are involved during the restoring step and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 10, lines 24-26; column 11, lines 8-22; Fig. 10).** *For example if the user select not to preserve the earlier point time, the point in time copy is overwritten and the corresponding bit in the bit map is set.*

6. In regard to claim 15, Young teaches:

A program product **(e.g., column 4, lines 17-19)** for use in a data storage environment and being for protecting data content during restoration of data from a second volume of data to a first volume of data," **(e.g., see column 1, lines 61-64; column 7, lines 30-38; element 4 in Fig. 1).**

"wherein the data storage environment includes:"

"a data storage system having a first volume of data denominated as the source being stored on a data storage system **(column 4, lines 11-15; element 6 in Fig. 1)**, and a second volume of data denominated as the clone and which has data content that is a copy of the data content of the source being stored on the data storage system or on another data storage system;" **(e.g., see column 4, lines 11-15; element 8 in Fig. 1).**

"the program product includes computer-executable logic contained on a computer-readable medium and which is configured for causing the following computer-executed steps to occur:" **(e.g., see column 25, lines 1-31; column 27, lines 38-46).**

"restoring the source by copying data content from the clone to overwrite the data content of the source;" **(e.g., see column 10, lines 7-10; column 11, lines 55-62).**

"allowing host reads and writes to the source;" **(e.g., see column 7, lines 18-38; column 8, lines 56-61; column 10, lines 20-26).**

"if preserving the data content of clone is selected, then not allowing it to be overwritten by host writes during the restoring step." **(e.g., see column 10, lines 27-32; column 11, lines 23-30; column 20, lines 4-7).** *For example a point in time copy of data to be overwritten is being saved in the shadow store. Therefore, a copy of data to be overwritten is preserved.*

"if preserving the data content of the clone is not selected, then overwriting the data content of the clone during the restoring step and determining extents on the source affected by any host write request;" **(e.g., see column 10, lines 18-26; column 11, lines 8-22; column 20, lines 1-3).** *For example if the user select not to preserve the*

previous point time copy, the user instruct the controller to overwrite the point time copy and update the bitmap to indicate the extents (e.g., blocks) affected.

"if any extents affected by the host write request are involved during the restoring step and preserving is not selected, then setting an indicator to indicate that the extents need to be re-copied." **(e.g., see column 10, lines 24-26; column 11, lines 8-22; Fig. 10).**

For example if the user select not to preserve the earlier point time, the point in time copy is overwritten and the corresponding bit in the bit map is set.

Response to Applicant's Remarks

The Applicant's Remarks have been carefully considered but is not persuasive. The Examiner respectfully disagree with the Applicant's argument that Young does not teach preserving or not preserving the data content of clone or shadow store during the restoration of the source or master store. Young teaches the shadow store keeps record of all the point time copy of data written in the master store. The user decides whether to preserve or overwrite (e.g., not preserve) a point time copy of data.

The Applicant specifically states:

"Hence, contrary to the Examiner's reason for the rejection, Young fails to describe elements of the claim with regard to overwriting the data contents of the clone during the restoring step if preserving the data content of the clone is not selected." *(Page 9 of Applicant's Remarks).*

However, contrary to Applicant's argument, Young teaches overwriting of data in the shadow store if the user chooses to do so. For example Young states:

"Recovery of a master copy from a point in time copy in the independent mode will now be described with reference to FIG. 6c which shows a flow chart for illustrating recovery of a master copy from a point in time copy.

When a user instructs recovery of a master copy either directly using the user interface 21 or via the network interface 93 in FIG. 1, then at S30b in FIG. 6c, the point in time copy controller 4 copies the shadow bitmap 10a to the copy bitmap 10b to indicate the data blocks in the shadow store 8 to be copied from the shadow store 8 back to the master store 6 and then clears the shadow bitmap.

Then at S31b in FIG. 6c, the point in time copy controller 4 checks to see whether the data processor 23 wishes to write new data to a data block in the master store 6. If the answer is yes, then the point in time copy controller 4 copies that data block from the shadow store 3 to the master store 6 at S34b and at S35b sets the corresponding copy bit to zero. Then, at S36b in FIG. 6c, the point in time copy controller 4 allows the new data to be written into that data block and sets the corresponding bit in the shadow bitmap to 1." *(Column 10, lines 7-26 of Young, emphasis added).*

The copy of a data block that is stored in the shadow store is copied to the master store and is overwritten and its corresponding bit in the bitmap set to 1. Then this block copied back to shadow store. The old copy of data is being lost. Fig. 10 more clearly describes the process of making a point in time copy for both cases of preserving and not preserving an existing point time copy in the shadow store. In summary, the Examiner believes that Young teaches all limitations as recited in the claims. Accordingly, the Examiner maintains his position and makes this Office Action final.

Conclusion

THIS ACTION IS MADE FINAL. *Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).*

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Hashem Farrokh whose telephone number is (571) 272-4193. The examiner can normally be reached Monday-Friday from ***8:00 AM to 5:00 PM.***

If attempt to reach the above noted Examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Donald A Sparks, can be reached on (571) 272-4201.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published application may be obtained from either private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBS) at 866-217-9197 (toll-free).

HF

HF

2007-05-20

Brian R. Peugh
Primary Examiner
4/24/07